

REMARKS

This communication is a full and timely response to the aforementioned non-final Office Action dated July 23, 2010. Claims 1-25 are not amended and remain in the application. Thus, claims 1-25 are pending in the application. Claims 1, 6, 11 and 14 are independent.

Reconsideration of the application and withdrawal of the rejections of the claims are respectfully requested in view of the foregoing amendments and the following remarks.

I. Rejections Under 35 U.S.C. § 103(a)

A. Claims 1-3, 6-8, 11-16, and 18-22 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ohuchi (U.S. Patent No. 5,025,481) in view of Saitoh et al. (U.S. Patent No. 6,272,248, hereinafter "Saitoh").

This rejection is respectfully traversed. The purported combination of Ohuchi and Saitoh cannot support the rejection of the claimed invention under 35 U.S.C. § 103(a), because these references do not establish that all the elements recited in the claimed invention were known in the prior art. See *KSR International Co. v. Teleflex, Inc.*, 82 USPQ2d 1385, 1395 (U.S. 2007); MPEP 2143.02.

Exemplary embodiments of the present disclosure provide an apparatus and method that minimize deterioration in output image quality by appropriately distinguishing the attributes of image areas, particularly halftone-dot regions, and performing processing properly suited to such areas.

As illustrated in Figure 1, for example, an exemplary embodiment¹ provides an image processing apparatus comprising a region determination unit 2, which includes a character determination unit 3 and a halftone-dot determination unit 4. As illustrated in Figure 2, for example, the halftone-dot determination unit 4 comprises a dividing unit 40 for dividing image data into large blocks of a prescribed size and further subdividing the large blocks into multiple smaller blocks. For example, as described in paragraphs [0025]-[0026] on pages 9 and 10 of the specification and as

¹ For the convenience of the Office and to illustrate support for the features of the claimed invention, references are made herein to exemplary embodiments described in the specification and the drawings. The references used herein are not intended to limit the claimed invention to the referenced embodiments.

illustrated in Figure 3, the dividing unit 40 divides the image data into large blocks having a size of $M \times N$ pixels, and further divides the large blocks into smaller blocks

① through ⑤ having a size of $(i) \times (j)$ pixels.

As illustrated in Figure 2, for example, the disclosed embodiment also comprises a large block isolated point calculation unit 46 for calculating a number of isolated points contained in each large block established by the dividing unit 40. In addition, as illustrated in Figure 2, the disclosed embodiment also comprises a small block isolated point calculation unit 41-45 for calculating a respective number of isolated points contained in each small block ① through ⑤ established by the dividing unit 40.

Furthermore, the disclosed embodiment comprises a halftone-dot region determination unit 47-49 for determining whether or not a large block is a halftone-dot region. As described in paragraph [0031], the halftone-dot region determination unit 47-49 determines that a large block is a halftone-dot region if the following two conditions are satisfied: (1) all small blocks contained in the large block have an isolated point contained therein, based on the respective number of isolated points that are calculated for each of the small blocks, and (2) the number of isolated points calculated to be contained in the large block is greater than or equal to a first prescribed value (e.g., threshold value illustrated in Figure 2).

Accordingly, the disclosed embodiment provides that the halftone-dot region determination unit 47-49 makes two determinations. In a first determination, the halftone-dot region determination unit 47-49 determines whether all small blocks contained in the specified large block have an isolated point contained therein, based on the respective second numbers calculated by the small block isolated point calculation unit 41-45. In a second determination, the halftone-dot region determination unit 47-49 determines whether the number of isolated points contained in the large block is greater than or equal to a first prescribed value.

Accordingly, the algorithm used by the halftone-dot region determination unit 47-49 means that the determination will be false if at least one small block does not have an isolated point contained therein, even if the second determination reveals

that the number of isolated points contained in the large block is greater than or equal to the prescribed value.

Independent claims 1, 6, 11 and 14 recite various features of the above-described exemplary embodiments. Claims 1 and 6 recite an exemplary apparatus, and claims 11 and 14 recite an exemplary method.

Claims 1 and 6 each recite an image processing apparatus that comprises a halftone-dot region determination unit for determining whether or not a specified large block is a halftone-dot region.

Claim 1 recites that the halftone-dot region determination unit determines that a specified large block among the large blocks established by the dividing unit is a halftone-dot region (1) if all small blocks in the specified large block have an isolated point contained therein, based on the respective second numbers calculated by the small block isolated point calculation unit, and (2) if the first number of isolated points calculated to be contained in the specified large block by the large block isolated point calculation unit is greater than or equal to a first prescribed value.

Claim 6 recites that the halftone-dot region determination unit determines that the large block is a halftone-dot region (1) if all small blocks in the large block have an isolated point contained therein, based on the respective first number of isolated points calculated by the small block calculation unit, and (2) if the second number of isolated points calculated to be contained in the large block by the large block isolated point calculation unit is greater than or equal to a first prescribed value.

The methods of claims 11 and 14 recite steps corresponding to the constituent elements of the image processing apparatuses of claims 1 and 6, respectively. Accordingly, claims 1, 6, 11 and 14 each comprise a halftone-dot region determination unit or determination steps which perform the following determinations:

(1) if all small blocks in the large block have an isolated point contained therein, and

(2) if the number of isolated points in the specified large block is greater than or equal to a first prescribed value,

to determine whether a large block containing the small blocks is a halftone-dot region.

As acknowledged by the Office, Ohuchi does not disclose or suggest the first determination (1) of claims 1, 6, 11 and 14. The Office applied Saitoh in an attempt to arrive at this feature of the claimed invention.

However, the disclosure of Saitoh does not support this interpretation.

With reference to Figures 99 and 100, Saitoh discloses a halftone-dot region determination unit 15105 (see Figure 99) and halftone-dot region determination processing (step S15201) in embodiments in the disclosed Twelfth Aspect for detecting a special document such as paper money (see Column 109, line 39 *et seq.*). In the Twelfth Aspect, Saitoh discloses that in a region determined to comprise a halftone-dot region in a relevant original image, distances between peaks in density variations waves are measured. Then, it is determined whether the original image includes the special document such as paper money by determining whether inter-peak distances are constant.

The functions of the halftone-dot region determination process are disclosed in Figure 101 and Column 111, lines 23-60. In particular, Saitoh discloses that the determination of whether each block comprises the halftone-dot region includes the following process: "the relevant block is determined to comprise the halftone-dot region if one or more peak pixels exist in the block" (see Column 11, lines 59 and 60).

Accordingly, Saitoh discloses that the halftone-dot region determination is performed for each block among a plurality of blocks that are obtained in a block production processing step (see S15302). Therefore, in contrast to the claimed invention, Saitoh discloses an opposite technique in which each block is separately processed, independent of one another, to determine whether each block individually contains a halftone-dot region.

On the contrary, claims 1, 6, 11 and 14 recite the feature of determining that a specified large block containing small blocks is a halftone-dot region if all small blocks in the large block have an isolated point contained therein. In contrast to the claimed invention, Saitoh does not determine whether a large block containing small blocks is a halftone-dot region if all blocks in the large block have an isolated point therein. Instead, as discussed above, Saitoh discloses that each block is separately

processed to determine whether each block individually contains a halftone-dot region.

Accordingly, similar to Ohuchi, Saitoh also does not disclose or suggest a halftone-dot region determination unit or determination steps which determine (1) if all small blocks in the large block have an isolated point contained therein, to determine whether a large block containing the small blocks is a halftone-dot region, as recited in claims 1, 6, 11 and 14.

Furthermore, in addition to failing to disclose or suggest all the recited features of claims 1, 6, 11 and 14, Applicants respectfully submit that there is no reason or motivation in Ohuchi or Saitoh for achieving the combination of features (1) and (2), as recited in claims 1, 6, 11 and 14. On the contrary, Ohuchi discloses a technique of determining whether a specified block is a half-tone dot region by determining whether the specified block, as well as the blocks neighboring blocks, constitute a halftone-dot region. Similar to Ohuchi, Saitoh discloses a process of determining whether each block in a collection of blocks separately contains a halftone-dot region.

Therefore, in addition to failing to disclose or suggest all the recited features of claims 1, 6, 11 and 14, Applicants respectfully submit that neither Ohuchi nor Saitoh, whether considered individually or in combination, provide any reason or motivation to achieve the combination of features (1) and (2) for determining whether a large block containing small blocks is a halftone-dot region.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that claims 1, 6, 11 and 14 are patentable over Ohuchi and Saitoh.

B. Dependent claims 4, 5, 9, 10, 17 and 23-25 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ohuchi in view of Saitoh and further in view of Kingetsu et al. (U.S. 6,268,935, hereinafter "Kingetsu"). This rejection is respectfully traversed for at least the following reasons.

Similar to Ohuchi and Saitoh, Kingetsu does not disclose or suggest the halftone-dot region determination units of claims 1 and 6 and the corresponding determining steps of claims 11 and 14.

Therefore, no obvious combination of Ohuchi and Kingetsu can arrive at the subject matter of claims 1, 6, 11 and 14, since Ohuchi and Kingetsu, either individually or in combination, fail to disclose or suggest all the recited features of claims 1, 6, 11 and 14.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that claims 1, 6, 11 and 14 are patentable over Ohuchi and Kingetsu.

Dependent claims 2-5, 7-10, 12, 12 and 15-25 recite further distinguishing features over Ohuchi and Kingetsu. The foregoing explanation of the patentability of independent claims 1, 6, 11 and 14 is sufficiently clear such that it is believed that separately arguing the patentability of the dependent claims is unnecessary at this time. However, Applicants reserve the right to do so if it becomes appropriate.

II. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. Accordingly, a favorable examination and consideration of the instant application are respectfully requested.

If, after reviewing this Amendment, the Examiner believes there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: November 23, 2010

By: /Jonathan R. Bowser/
Jonathan R. Bowser
Registration No. 54574

Customer No. 21839
703 836 6620